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(56) Documents cited  
GB 2233599 A US 4916818 A US 4760646 A

(58) Field of search  
UK CL (Edition L) A1E EBD, A1F FDD, B5L LEX LK  
LQ LUX LX  
INT CL<sup>5</sup> A01G, B26B

(54) Power tool extension attachment

(57) The attachment comprises a main spar (10) carrying at its forward end a cradle (12) on which a power tool such as a hedge trimmer (14) or power pruning saw can be detachably mounted and having towards its rear end a counterweighted handle (20) adjacent with an on/off switch (22). A control arm (16) coupled by control rods (18) to the cradle enabling the power tool to be adjusted in pan and tilt.

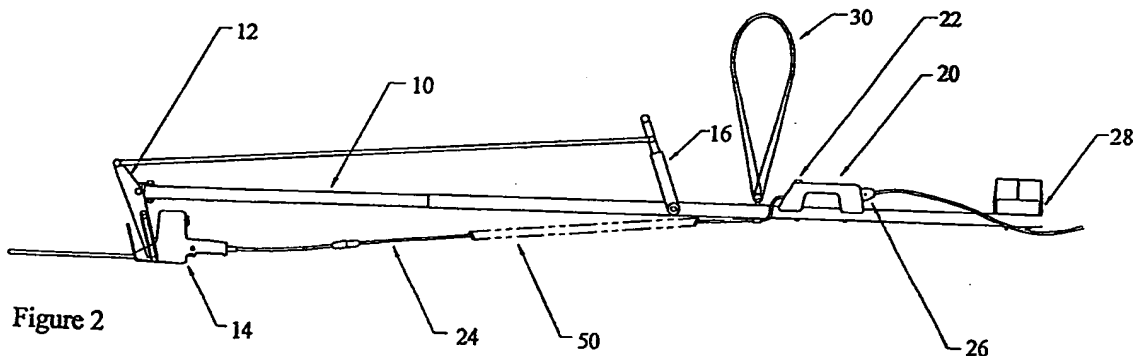


Figure 2

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

GB 2 266 682 A

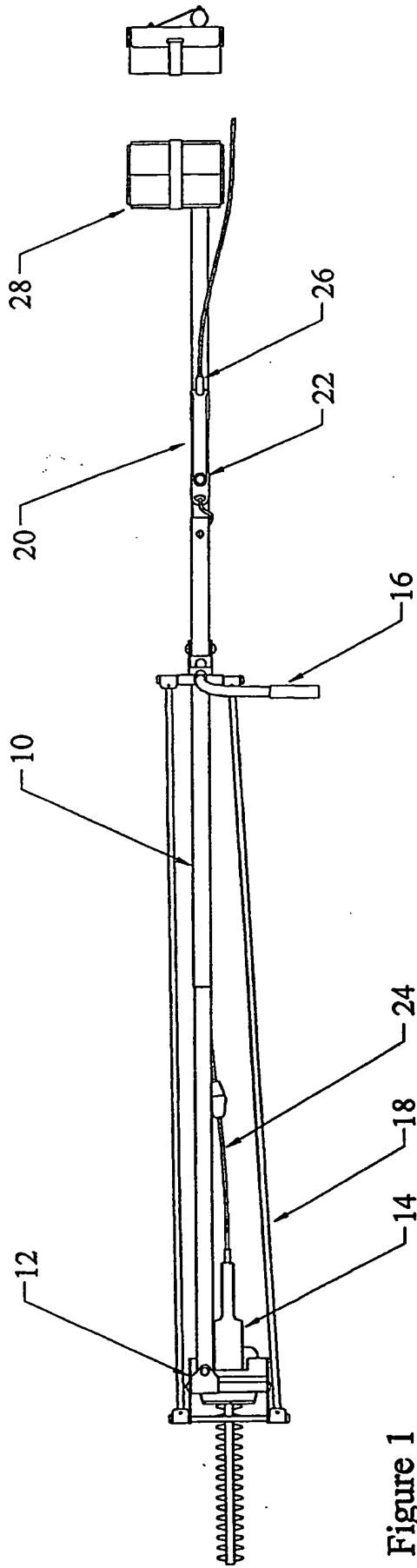


Figure 1

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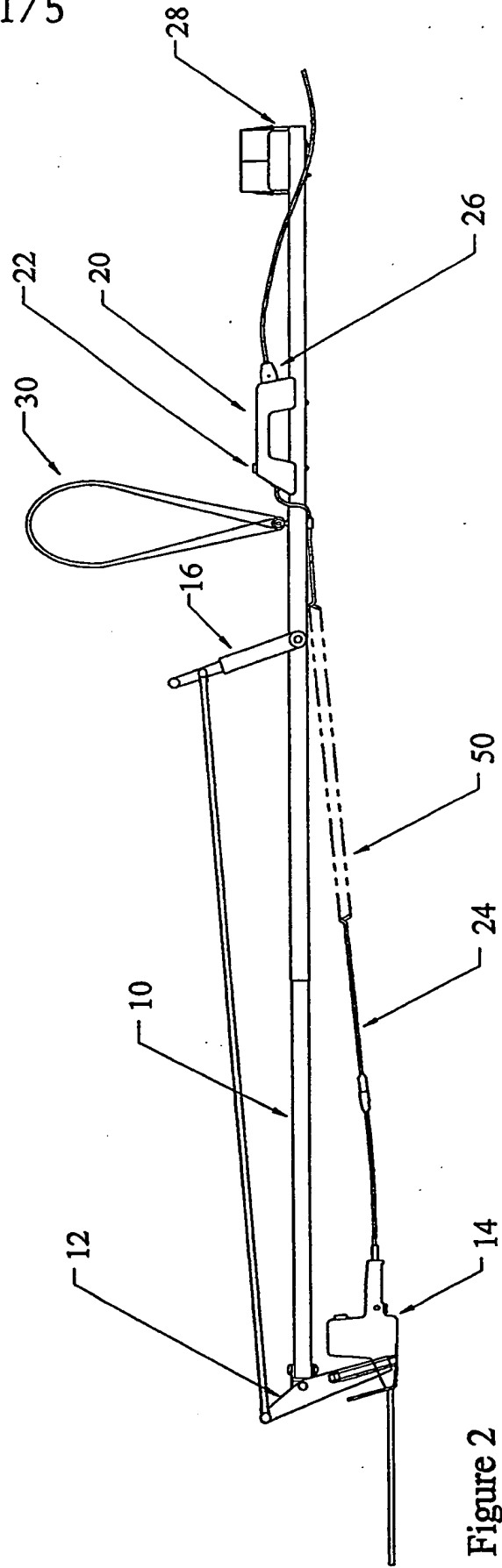


Figure 2

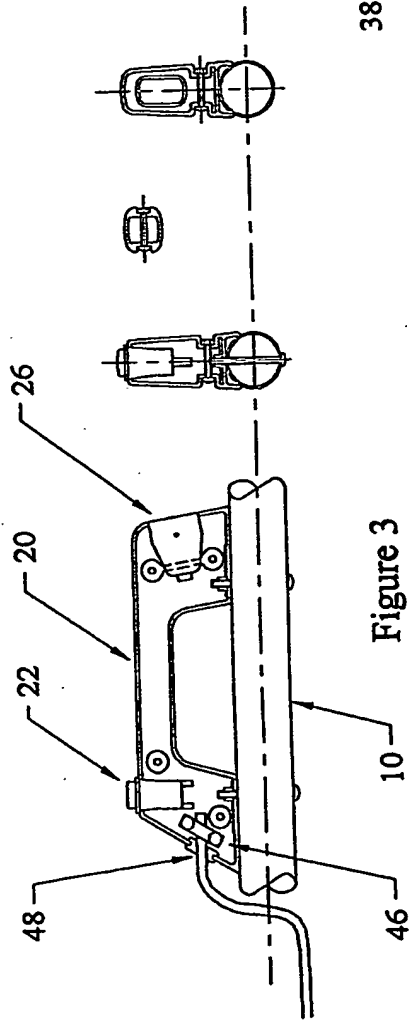


Figure 3

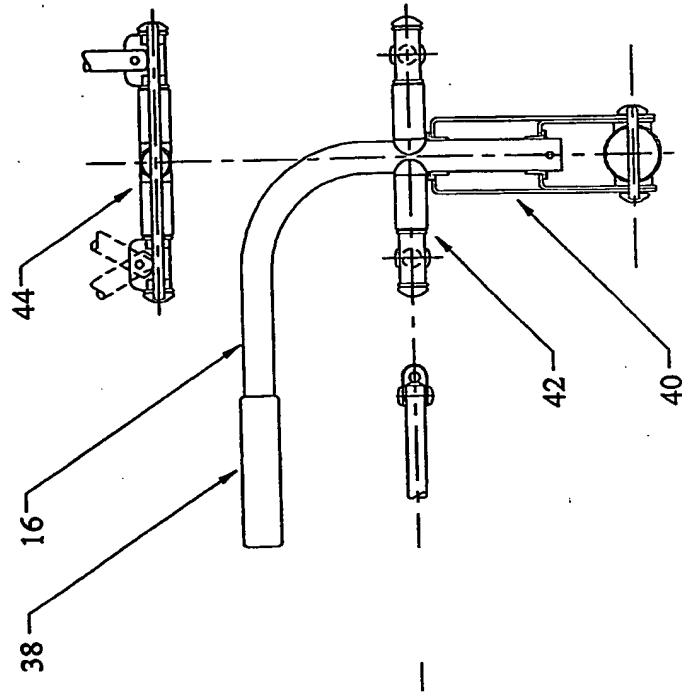


Figure 5

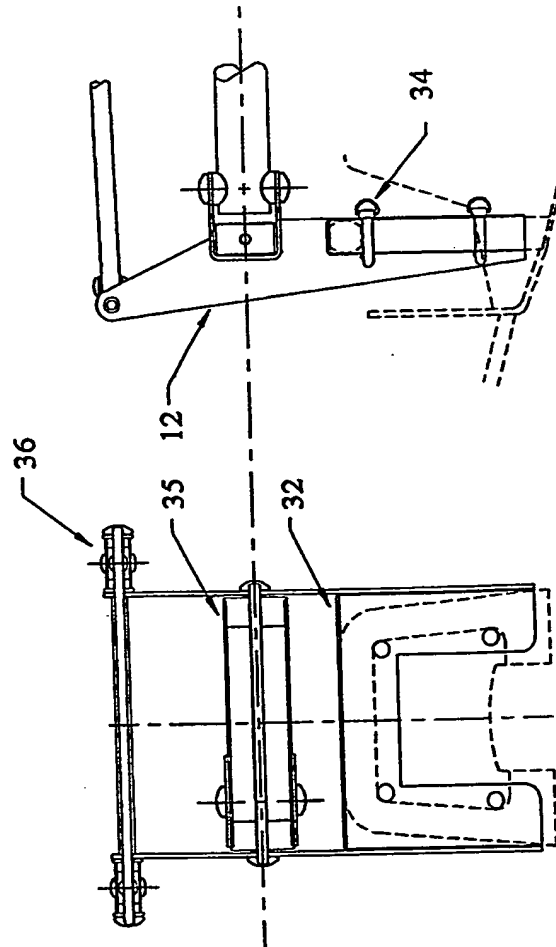


Figure 4

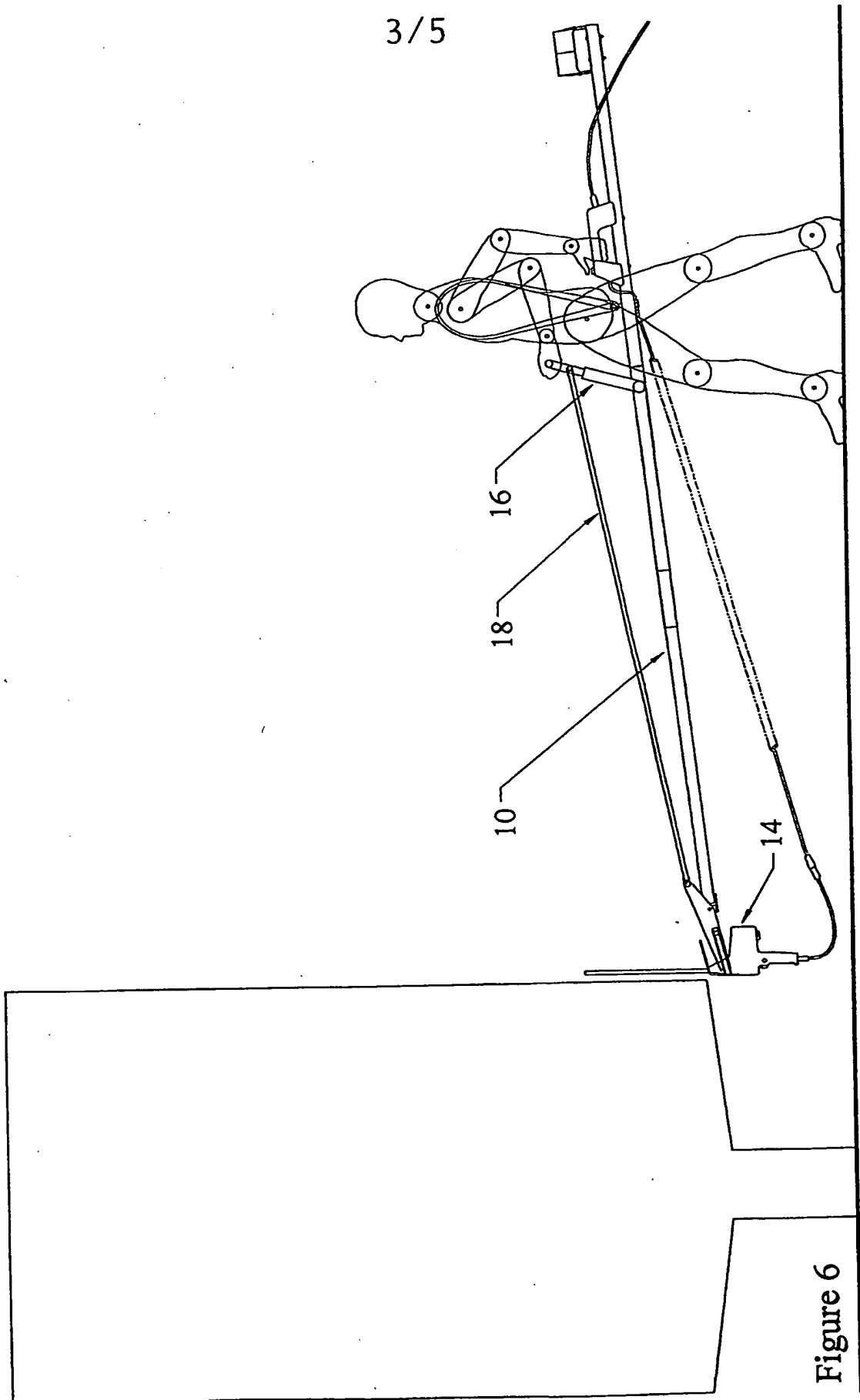


Figure 6

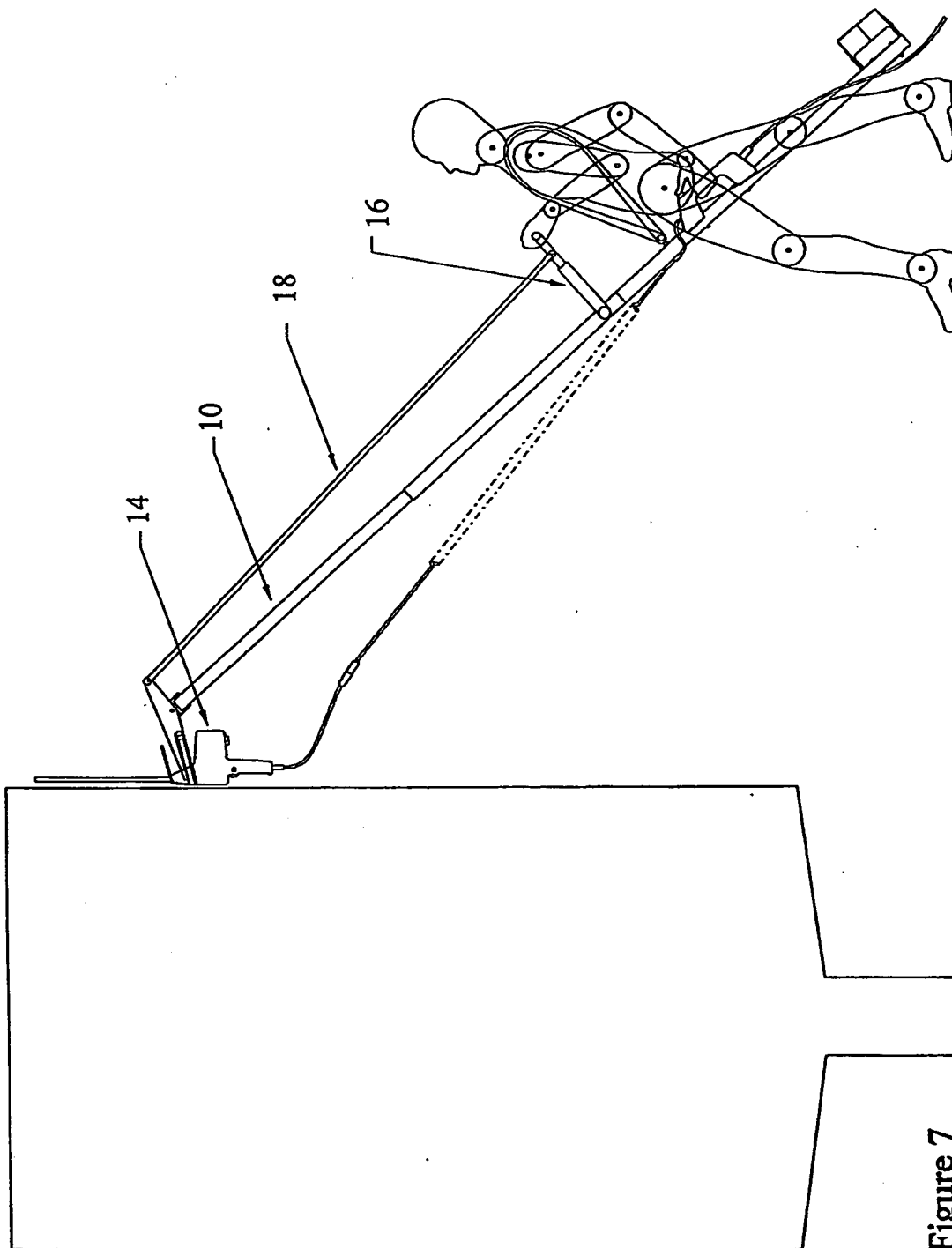


Figure 7

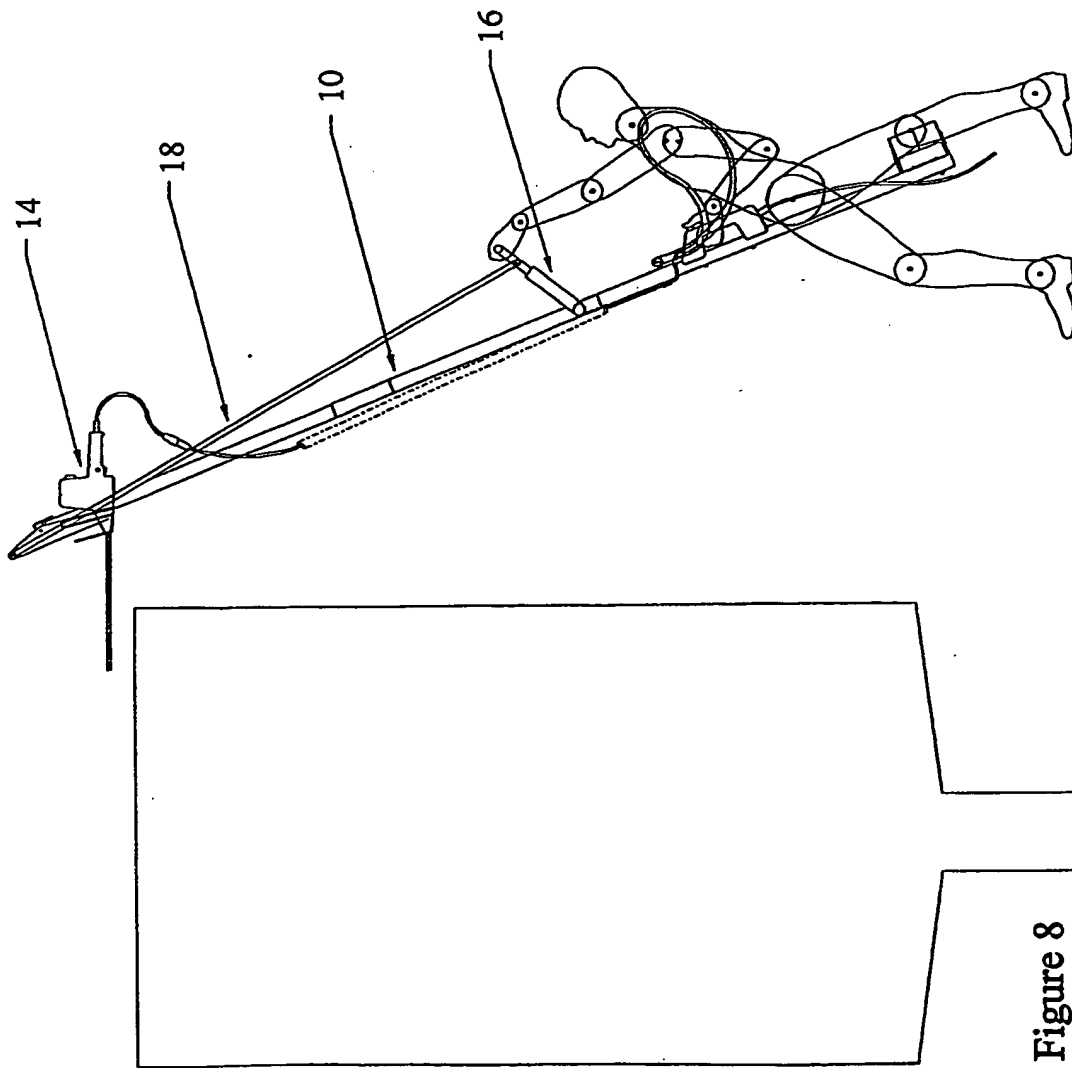


Figure 8

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- 1 -

Title    Power Tool Extension Attachment

Field of the invention

This invention relates to an attachment for a power tool, such for example as a power pruning saw or more especially a hedge trimmer, to extend the normal range of operation to an increased distance from the user, especially in height.

Background to the invention

In use of a domestic or an industrial hedge trimmer, the range of operation is normally limited to a height of the order of the height of the operator. Where trimming of a high hedge is required, ladders or steps have to be employed to enable the operator to access the higher parts of the hedge. Sometimes, as when a hedge is sited on top of a bank, the erection of some form of scaffolding is necessary. The same problem can arise with a power pruner or saw for cutting the overhead branches of trees.

It is an object of this invention to provide a solution to the aforesaid problem, whereby the use of ladders, steps or scaffolding is rendered unnecessary for trimming or cutting up to a certain level above the normal maximum possible height.

The invention

According to one aspect of the invention, there is

provided a power tool extension attachment comprising a main spar, a cradle pivotally mounted at a forward end of the main spar for detachably holding the power tool, a handle at or near the rear end of the spar, a switch means on or adjacent the handle for controlling on/off operation of the power tool, a control arm pivotally mounted relative to the main spar adjacent the handle, and at least one control rod interconnecting the control arm and the power tool cradle whereby at least the angle of tilt of the axis of the power tool can be adjusted relative to the axis of the main spar.

Preferably, the cradle and the control arm are pivotally mounted relative to the main spar and interconnected so that not only the tilt but also the pan of the cutting blade of the power tool can be adjusted, i.e. the angle of orientation of the cutting blade of the power tool about its axis can be adjusted.

Tilt of the power tool cradle is preferably controlled by pivotal forward and backward movement of the control arm relative to the length of the main spar, whilst pan is controlled by rotation of the control arm about the main spar. This control can be enabled by use of two parallel control rods interconnecting the control arm and the cradle.

The switch means preferably controls supply of power to the power tool from the region of the handle, where a socket is provided for connection of a power supply lead. In use, therefore, the in-built power switch on the tool will be fixed in the "on" condition, and a power connecting lead extending from the handle region through the aforesaid switch means will plug into the in-built



power supply socket on the power tool. This connecting lead may incorporate a coiled section to accommodate expansion and reduction in length when the power tool is adjusted in tilt.

The degree of tilt available will preferably be at least 90 degrees so that, in the case of a hedge trimmer for example, the horizontal flat top of a high hedge can be trimmed as well as its vertical sides.

Preferably, behind the handle, the main spar is provided with a counterweight or with means for carrying a counterweight.

Also, adjacent the handle, a shoulder strap is provided for assistance in supporting the weight of the equipment.

The invention also extends to a kit of parts for construction of the afore-described power tool extension attachment.

Thus, in accordance with a further aspect of the invention there is provided a kit of parts comprising a main spar which can be assembled from two or more spar lengths, means for assembly of a power tool cradle and for mounting said cradle to a forward end of the main spar, a handle mounted on or mountable on the main spar towards the rear end of said spar, said handle incorporating a switch means for controlling on/off operation of a power tool carried by the cradle, a control arm pivotted to or pivotally mountable to the main spar adjacent the handle, and at least one control rod assembled from two or more rod lengths and interconnectable between the control arm and the cradle to enable at least the tilt of the cutting

blade of the power tool to be adjusted.

While not limited thereto, the invention has particular applicability to an extension attachment for a hedge trimmer.

#### Description of embodiment

An extension attachment in accordance with the invention will now be described by way of example with reference to the accompanying drawings, in which:-

Figures 1 and 2 show the attachment, with a power hedge trimming tool mounted thereto, in respective side views mutually at right angles;

Figures 3 to 5 show details of a handle assembly, cradle assembly and control arm assembly, respectively;

Figures 6 and 7 show the attachment and hedge trimmer mounted thereto, when in use for trimming the vertical side of a high hedge; and

Figure 8 shows the attachment and hedge trimmer mounted thereto, when in use for trimming the horizontal top of a high hedge.

The illustrated and described embodiment can enable the trimming of vertical sides of hedges up to about 3.8 metres high, and the trimming of flat tops of hedges up to about 3 metres high. The attachment provides for both tilt and pan adjustment, but pan adjustment is generally required only when trimming a vertical hedge side,

enabling the operator to traverse sideways whilst maintaining the trimmer blade width parallel to the face being trimmed.

The drawings illustrate the principle of the device, and a simple method of construction possible with minimum special tooling. This method of manufacture is merely an example, and improvements may be made for volume production by replacing fabricated assemblies with, e.g., injection mouldings or diecastings.

The device is especially intended to be supplied in a part-assembled form, so that the packaged product is no longer than 1250 mm, for convenience of palletted transport, and easy display on shop shelving.

The drawings show a typical and commonly used model of hedge trimmer, but the device is adaptable to enable a range of different models to be mounted thereto.

Referring to Figures 1 and 2, the device or attachment comprises a main spar 10, a cradle 12 for the trimmer 14 pivotally mounted at the front end of the main spar, a control arm 16, two parallel control rods 18 interconnecting the control arm 16 and the cradle 12, a handle 20, an on/off switch 22 on the handle, a cable 24 connecting a power input socket 26 on the handle with a power input socket on the trimmer 14, a counterweight carrier 28 and a shoulder strap 30.

These parts are illustrated in Figures 3 to 5 and now briefly described with reference thereto.

The main spar 10 is made of tube, in three pieces that fit

inside each other, and bolted together by the user, of strong, lightweight material, e.g. heat treated aluminium alloy or carbon fibre composite.

The trimmer cradle 12 is a fabricated assembly made up of an inverted "U", of a channel section 32, that fits over the cross handle of the trimmer. Aircraft type rigging pins 34 with sprung ball detents are inserted through holes in this U member, to allow quick attachment or removal of the trimmer. Holes in different positions as necessary can be used for different models of trimmer. Extended side plates are permanently attached to the U member, and have pivots for a tubular axle beam 35, and clevis bearings 36 for control rods at the top. The axle beam has an offset clevis bracket, which is attached to the main spar pivotally at right angles to the axle.

The control arm 16 is a bent tube of inverted "L" shape, fitted with a cycle type handgrip 38, that is mounted pivotally and axial vertically in a trunnion 40 that is pivotally attached to the main spar, in a direction parallel to the trimmer cradle axle. The position of this pivot is approximately two thirds of the way along the main spar, from the trimmer end. Above the trunnion, a cross tree beam 42 is pivotally mounted parallel to the trunnion axis, which carries a control rod clevis at each end.

The control rods 18 are made of tube, each in two main parts, bolted together by the user, of lightweight and strong material, e.g. aluminium alloy. A through hole is drilled near to each end, parallel in axis. A domed plastics insert fits in each end, and is secured by the pivot pin fitted through the clevises at the control arm

and trimmer cradle assemblies. The clevises form universal joints, with horizontal "U" members that pivot around their respective axles and plastics shoulder bushes, retained by pivot pins, with the domed inserts bearing against the axles, as indicated at 44.

The handle 20 is made of non-conducting material for electrical safety, and is typically a two part injection moulding. The handle 20 is bolted to the main spar 10 a short way behind the control arm, and incorporates a momentary action push button switch 22, a standard garden appliance connector 26, internal cable clamp 46, and a grommated cable outlet 48. Internal wiring connects the connector to the switch, where the outlet cable is also connected, and clamped before its outlet through the grommated hole at the front.

The cable 24 is routed from the handle around the main spar to a cable clamp on the bottom surface, and thence to the trimmer, terminating in a standard garden appliance connector. It can thus be seen that the supply cable lead can conveniently be plugged directly into the trimmer for independent use, or into the handle of the extension arm for use in that mode. The outlet cable has part of its length formed into a lightly sprung coiled length 50, which helps to tidily manage the variance in distance between the trimmer and the control arm during operation.

The counterweight carrier 28 is a formed tray, mounted to the extreme end of the main spar, and is proportioned to accept a weight to counterbalance the moment of the front extension with the trimmer attached. This weight can conveniently be, e.g., two house bricks, which are commonly available. An elastic strap retains the bricks

properly in place.

The shoulder strap 30 is a golf bag type strap, suitably padded for comfort, and pivotally connected to an eye-bolt on the main spar, between the control arm and the handle, at the notional centre of gravity of the assembled device.

In use the integral switch on the hedge trimmer is set to permanently on and, for safety, before the supply cable lead is plugged into the handle of the extension arm device. Some trimmers cannot be switched permanently on, so a supplied plastic clamp would be used in this case.

With the strap over one shoulder, the device should approximately balance horizontally for the most convenient use.

When the control arm is moved forwards or backwards, the trimmer tilts in the same direction.

When the control arm is turned, the trimmer will also turn.

The operations shown in Figures 6, 7 and 8 can therefore be achieved in a more convenient time and fashion than possible without the device.

When the mode is for trimming the extremes in height, the user has to lift the device via the handle, to obtain extra reach. The effort in doing this is more than for the lower areas, as the benefit of support from the shoulder strap is lost, but would be occasional, not continuous effort. The overall weight of the device with

trimmer and counterbalance is approximately the same as a full set of golf clubs, and for the average hedge, the time spent trimming would be minutes rather than hours.

Various modifications of the above described and illustrated arrangement are possible within the scope of the invention hereinbefore defined.

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Claims

1. A power tool extension attachment comprising a main spar, a cradle pivotally mounted at a forward end of the main spar for detachably holding the power tool, a handle at or near the rear end of the spar, a switch means on or adjacent the handle for controlling on/off operation of the power tool, a control arm pivotally mounted relative to the main spar adjacent the handle, and at least one control rod interconnecting the control arm and the power tool cradle whereby at least the angle of tilt of the axis of the power tool can be adjusted relative to the axis of the main spar.
2. An attachment according to claim 1, wherein the cradle and the control arm are pivotally mounted relative to the main spar and interconnected so that not only the tilt but also the pan of the cutting blade of the power tool can be adjusted, i.e. the angle of orientation of the cutting blade of the power tool about its axis can be adjusted.
3. An attachment according to claim 2, wherein tilt of the power tool cradle is controlled by pivotal forward and backward movement of the control arm relative to the length of the main spar.
4. An attachment according to claim 2 or claim 3, wherein pan of the power tool cradle is controlled by rotation of the control arm about the main spar.



5. An attachment according to claim 3 or claim 4, wherein tilt and pan control as aforesaid is enabled by use of two parallel control rods interconnecting the control arm and the cradle.
6. An attachment according to any of claims 1 to 5, wherein the switch means controls supply of power to the power tool from the region of the handle, where a socket is provided for connection of a power supply lead.
7. An attachment according to claim 6, wherein the in-built power switch on the tool is fixed in the "on" condition, and a power connecting lead extending from the handle region through the switch means plugs into the in-built power supply socket on the power tool.
8. An attachment according to claim 7, wherein the connecting lead incorporates a coiled section to accommodate expansion and reduction in length when the power tool is adjusted in tilt.
9. An attachment according to any of claims 1 to 8, wherein the angle of tilt available is at least 90 degrees.
10. An attachment according to any of claims 1 to 9, wherein, behind the handle, the main spar is provided with a counterweight or with means for carrying a counterweight.
11. An attachment according to any of claims 1 to 10, wherein, adjacent the handle, a shoulder strap is provided for assistance in supporting the weight of the equipment.

12. A kit of parts for producing a power tool extension, comprising a main spar which can be assembled from two or more spar lengths, means for assembly of a power tool cradle and for mounting said cradle to a forward end of the main spar, a handle mounted on or mountable on the main spar towards the rear end of said spar, said handle incorporating a switch means for controlling on/off operation of a power tool carried by the cradle, a control arm pivotted to or pivotally mountable to the main spar adjacent the handle, and at least one control rod assembled from two or more rod lengths and inter-connectable between the control arm and the cradle to enable at least the tilt of the cutting blade of the power tool to be adjusted.

13. A power tool attachment or kit of parts therefor, wherein the power tool is a hedge trimmer.

14. A power tool extension attachment substantially as hereinbefore described with reference to the accompanying drawings.

**Parents Act 1977**  
**Examiner's report to the Comptroller under**  
**Section 17 (The Search Report)**

Application number

GB 9209949.8

**Relevant Technical fields**

(i) UK Cl (Edition L ) B5L (LK LQ LUX LX LEX)  
 A1E (EBD)  
 A1F (FDD)  
 (ii) Int Cl (Edition 5 ) A01G  
 B26B

**Search Examiner**

R HOWE

**Date of Search**

20 MAY 1993

**Databases (see over)**

(i) UK Patent Office

(ii)

Documents considered relevant following a search in respect of claims 1-14

| Category<br>(see over) | Identity of document and relevant passages | Relevant to<br>claim(s) |
|------------------------|--|-------------------------|
| X                      | GB 2233599 A (PALLISTER)                   | 1, 6, 9,<br>12, 13      |
| X                      | US 4916818 (PANEK)                         | 1, 9, 12,<br>13         |
| X                      | US 4760646 (SIEGLER)                       | 1, 9, 11,<br>12, 13     |

| Category | Identity of document and relevant passages | Relevant to claim(s) |
|----------|--|----------------------|
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